

Toxics in Fish

Toxic contaminants in fish[†]

Progress Toward the 2020 Target

Part 1: By 2020, contaminant levels in fish will be below health effects thresholds (i.e., levels considered harmful to fish health, or harmful to the health of people who consume them).

Part 2: By 2020, contaminant-related disease or impairments in fish are reduced to background levels.

Of the four classes of toxic chemicals being tracked and reported on, two show signs of progress (PBDEs and PAHs), one shows no change (PCBs), and for one of the four there is not enough information to determine if progress is being made (EDCs). From a fish health perspective (part 2 of the target), there has been a decline in PAH-related liver disease in English sole over the past 24 years.



Is There Progress Toward the 2020 Target?

Progress in reducing the level of toxic contaminants in fish below their respective target value has been mixed.

Making progress toward 2020 targets requires identifying which chemicals are most problematic, and then controlling their sources or cleaning up pollutants that have accumulated in the environment. In some cases we can expect a significant time-lag between source control and the desired result of reducing the exposure of organisms to contaminants.

[†] This report is adapted from the 2012 *State of the Sound* because no new data were available.

Status of Four Contaminants in Fish in Puget Sound Relative to Their Target Values

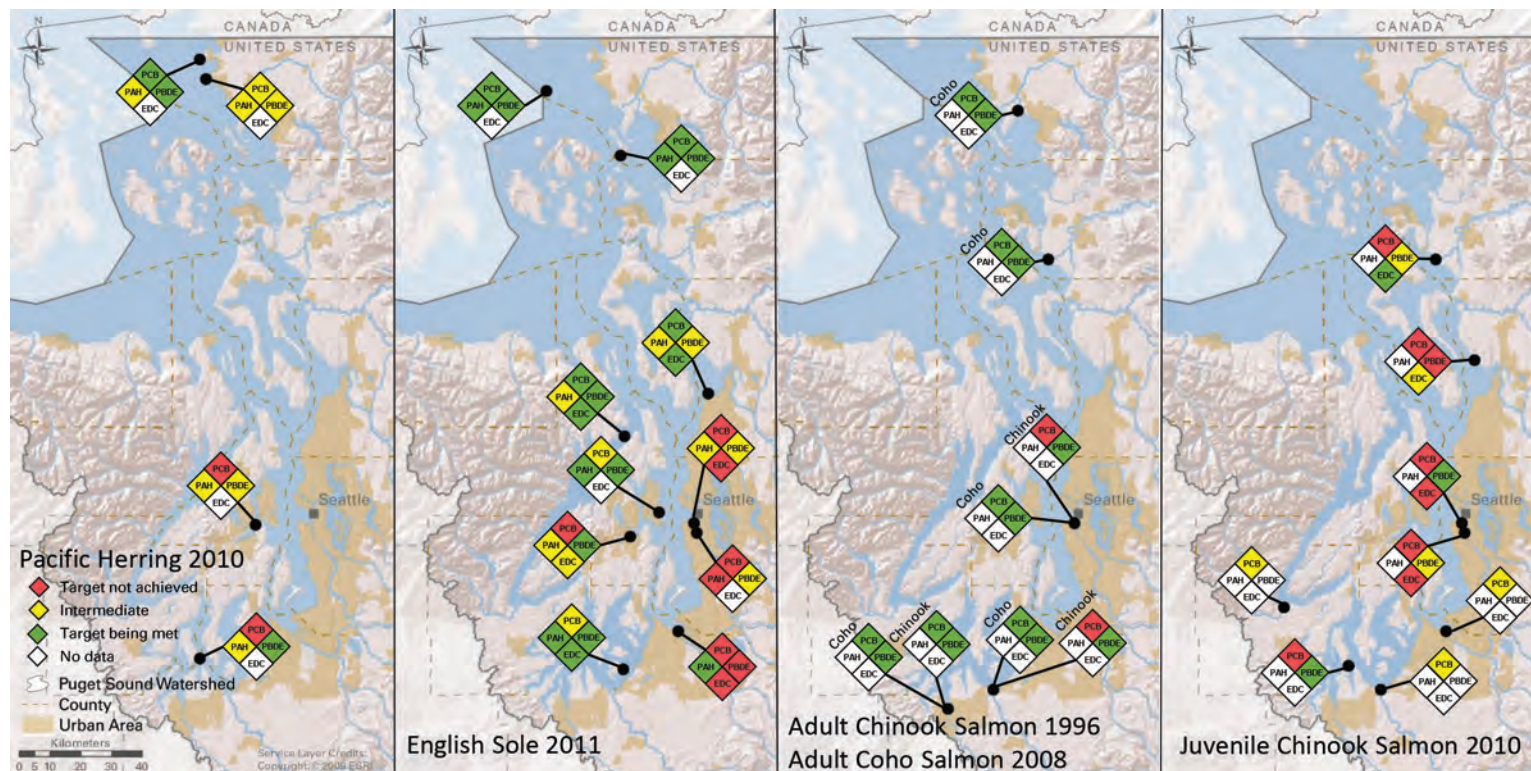


Figure 3.22.

Source: Washington Department of Fish and Wildlife

The four types of contaminants in this target are:

- Polychlorinated biphenyls (PCBs)
- Flame retardants (polybrominated diphenyl ethers, or PBDEs)
- Hydrocarbons (products of petroleum or combustion; polycyclic aromatic hydrocarbons, or PAHs)
- Endocrine disrupting compounds (typically from pharmaceuticals, personal care products, but also from a wide range of other chemicals, or EDCs).



Polychlorinated biphenyls (PCBs)

The danger of PCBs in the environment was recognized, and production banned more than 30 years ago. PCB levels in Puget Sound fish today are probably 10 times lower than they were in the 1970s, but they have not declined in the past 20 years. PCB levels in most recent samples are high enough to trigger Department of Health consumption advisories for Chinook salmon and other species, and are probably still high enough to harm fish health. Further reduction of PCBs in the ecosystem will likely require a combination of activities, including cleaning up contaminated sediments, identifying and halting new sources of PCBs into the system, and waiting for existing PCBs in the system to degrade or become unavailable.

Flame retardants (polybrominated diphenyl ethers, or PBDEs)

Some progress toward 2020 targets for PBDEs has been made. The danger of flame retardants was recognized relatively recently, and source controls have been imposed. These include a legislated ban on the use of certain PBDE compounds and voluntary reduction in production of other compounds by industry. Although it is unclear whether these actions were responsible, PBDEs have been declining in one monitored species, Pacific herring, from Central and North Puget Sound.

Hydrocarbons (products of petroleum or combustion; polycyclic aromatic hydrocarbons, or PAHs)

Progress related to hydrocarbons (PAHs) has been mixed. This is probably related to the huge range of sources for these compounds (they come from petroleum, and from burning fossil fuels), and the difficulty in controlling such pervasive sources. Exposure of English sole to PAHs has dropped significantly in Elliott Bay, resulting in a recovery of their health (see Disease on the following page). PAH exposure in Pacific herring remains moderately high in most locations.

Endocrine disrupting compounds (EDCs)

Not enough monitoring has been conducted yet to fully evaluate progress towards the target of reducing EDCs. These chemicals originate from a huge range of sources including pharmaceuticals, personal care products, plastics, other industrial, agricultural, or household products, and some of the chemicals described above. Many of these chemicals can be introduced to aquatic systems via wastewater.

Disease

The second part of the Toxics in Fish target is about reducing contaminant-related disease or impairments in fish to background levels. We focus on the effects of PAHs and EDCs. There has been a dramatic decline in PAH-related liver disease over the past 24 years, from prevalence rates of more than 30 percent to less than 10 percent in English sole in Elliott Bay, one of Puget Sound's most highly contaminated bays. The reason for declining PAHs in Elliott Bay is unclear, but could be related to sediment cleanup, removal of creosote-treated pilings, or control of new inputs to the bay.

EDC effects were observed in fish, primarily as a trend toward feminization of males, in most places where English sole and juvenile salmon were sampled. Only one status survey has been conducted for these species so far; additional surveys are in progress.



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For more in-depth information, please see:

www.psp.wa.gov/vitalsigns/toxics_in_fish.php

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